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<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/083,598	ITAKURA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Thomas H Parsons	1745	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 16 March 2004.
2. ☒ The allowed claim(s) is/are 1-5.
3. ☒ The drawings filed on 16 March 2004 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

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|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                    |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

***Response to Amendment***

This is in response to the Amendment filed 16 March 2004.

***Specification***

1. The objection to the disclosure because of minor informalities has been **withdrawn** in view of Applicants' Amendment.

***Drawings***

2. The objection to the drawings as failing to comply with 37 CFR 1.84(p)(4) because the same reference character has been used to designate different parts has been **withdrawn** in view of Applicants' Amendment.

3. The objection to the drawings as failing to comply with 37 CFR 1.84(p)(5) because they do not include reference sign(s) mentioned in the description has been **withdrawn** in view of Applicants' Amendment.

4. The objection to Figures 13-15 for not being designated by a legend such as --Prior Art-- because only that which is old is illustrated has been **withdrawn** in view of Applicants' Amendment.

***Claim Rejections - 35 USC § 112***

5. The rejection of claims 1-2 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention has been **withdrawn** in view of Applicants' Amendment.

***Claim Rejections - 35 USC § 102***

6. The rejection of claim 1 under 35 U.S.C. 102(b) as being anticipated by Applicants' Prior Art Figures has been **withdrawn** in view of Applicants' Amendment.

***Allowable Subject Matter***

7. Claims 1-5 are allowable over the prior art of record.

***Reasons for Allowance***

8. The following is an examiner's statement of reasons for allowance:

The claimed invention includes at least two protrusions that protrude toward opposite sides which appear upon at-a-right-angle projection of a second substrate onto a first substrate, and a method of using the same to assembly a thermoelectric module in a radiating member. The Applicants disclose that because of the protrusions support arms push the respective protrusions of the first substrate under pressure to push the first substrate toward the radiating member without being slanted or rock the first substrate in the direction orthogonal to the pushing direction, thereby being capable of bonding a first substrate to the radiating member through melted solder. Since forces for pushing and rocking the first substrate are transmitted not through the thermoelectric semiconductor chips but directly to the first substrate from the respective protrusions, the bonding portions of the thermoelectric semiconductor chips and the electrodes through the first solder are not broken, and accordingly there is no fear that the thermoelectric module is broken. Further, the Applicants provide comparative data comparing the instantly claimed thermoelectric module and method of making the same with a prior art thermoelectric

module and corresponding prior art method of making the same wherein the module has only one protrusion. The data show that the instantly claimed module can be assembled without being broken.

Therefore, a search of the prior art of record failed to reveal or explicitly teach what is instantly claimed: in particular,

A thermoelectric module, comprising: a plurality of thermoelectric semiconductor chips; first and second substrates; a plurality of first and second electrodes formed on said first and second substrates, respectively; and a first solder through which said first and second electrodes are bonded to respective end portions of said thermoelectric semiconductor chips in order to connect the plural thermoelectric semiconductor chips in series, said first substrate being made to include at least two protrusions that protrude toward opposite sides which appear upon at-a-right-angle projection of the second substrate onto the first substrate. **For this reason, claim 1 and claim 2, which is dependent thereon, are patentably distinct from the prior art of record.**

A method of assembling a thermoelectric module in a radiating member, comprising the steps of: mounting the first substrate of the thermoelectric module according to claim 1 on a radiating member through second solder having a liquidus temperature lower than a solidus temperature of the first solder; holding the respective protrusions of the first substrate by leading edges of corresponding support arms in a state where the second solder is melted, and pushing the first substrate toward the radiating member under pressure while rocking the first substrate in a direction orthogonal to the pushing direction. **For this reason, claim 3 and claims 4-5, which are dependent thereon, are patentably distinct from the prior art of record.**

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas H Parsons  
Examiner  
Art Unit 1745

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CAROL CHANEY  
PRIMARY EXAMINER